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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,977	01/26/2006	Shinsuke Tsuji	284308US0PCT	9438
22850 7590 03/01/2010 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER BERNSHTEYN, MICHAEL	
			ART UNIT	PAPER NUMBER
			1796	
			NOTIFICATION DATE	DELIVERY MODE
			03/01/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/565,977	Applicant(s) TSUJI ET AL.	
	Examiner MICHAEL M. BERNSHTEYN	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action follows a response filed on November 2, 2009. Claims 1 has been cancelled; no claims have been cancelled or added.
2. In view of the amendment(s) and remarks, the ODP rejection of claims 1, 3-5, 8, and 10-20, the rejection of claims 1-20 under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (JP 2003-195501) in view of Suwa et al. (U.S. Patent 6,593,043 or CN 135635 A) have been withdrawn.
3. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.
4. Claims 1-20 are pending.

Claim Rejections - 35 USC § 103

5. The text of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.
6. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (JP 2003-195501) in view of Watanabe et al. (U. S. Patent 6,746,812) and Suwa et al. (U.S. Patent 6,593,043 or CN 135635 A).

With regard to the limitations of claims 1,4, 11 and 12, Takagi discloses a positive photosensitive resin composition, comprising an alkali-soluble resin comprising a copolymer at least comprising 50 mol% of N-(4-hydroxyphenyl) **maleirnide, 1,2-quinone diazide** compound and at least one crosslinking agent, wherein the alkali-soluble resin consists of at least 50mol % of N-(4-hydroxyphenyl) maleimide and other

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copolymerizable component such as methacrylate, methacrylate-based monomer, other unsaturated carboxylic acid and the like, N-phenylmaleimide, etc. so the obtained polymer corresponds to the alkali-soluble resin in Claim 1 (page 3, [0010], [0014], [0015], page 5, [0021]); the weight average molecular weight of the alkali-soluble resin is preferably 3000-70000 (page 5, [0021, line 23]); and 1,2-quinone diazide compound has a structure represented by formula (1), wherein X1-X15 are the same or different, selected from H atom, alkyl, alkoxy represented by -OD (D is H atom or quinone diazide skeleton, at least one of X1-X5 is -OD).

The crosslinking agent can be an epoxy compound such as 3,4-epoxycyclohexylmethyl(3,4-epoxycyclohexyl) carboxylate (corresponding to the crosslinking compound satisfying the structure formula in claim 1 when m=2 and n=2), and the crosslinking agent is preferably used in an amount of 4-40 parts by weight relative to the alkali-soluble resin (page 14, [0055, lines 43-44).

With regard to the limitations of claims 1, 4, 11 and 12, Takagi does not disclose the following: (1) N-cyclohexylmaleimide, N-methylmaleimide and N-ethylmaleimide, (2) the number average molecular weight of the alkali-soluble resin defined in claim 1, and (3) the main structure of the 1,2-quinone diazide compound

Watanabe discloses that specific examples of the preferred compounds as an alkali-soluble resin are N-substituted maleimides such as **N-methylmaleimide**, **N-ethylmaleimide**, N-propylmaleimide, N-butylmaleimide, N-pentylmaleimide, N-hexylmaleimide, **N-cyclohexylmaleimide**, N-pentylmaleimide, N-hydroxymaleimide, etc. (col. 76, lines 39-67).

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Therefore, all of the above compounds are functional equivalents and can be substituted by each other. Thus, Watanabe recognizes the equivalency of N-(4-hydroxyphenyl) maleimide and N-pentylmaleimide used by Takagi and N-cyclohexylmaleimide, N-methylmaleimide and N-ethylmaleimide as alkali-soluble resins for positive photosensitive resin composition. In the instant case the substitution of equivalents solvents requires no express motivation, as long as the prior art recognize equivalency, ***In re Fount***, 213 USPQ 532 (CCPA 1982); ***In re Siebentritt***, 152 USPQ 618 (CCPA 1967); ***Graver Tank & Mfg. Co. Inc. V. Linde Air Products Co.*** 85 USPQ 328 (USSC 1950), and a person skilled in the art would have found obvious to substitute -(4-hydroxyphenyl) maleimide and N-pentylmaleimide of Takagi for N-cyclohexylmaleimide, N-methylmaleimide or N-ethylmaleimide of Watanabe based on their recognized equivalency and with the reasonable expectation of success.

As to difference (2), the person skilled in the art can confirm that claim 1 aims to resolve the technical problem of selecting the alkali-soluble resin having certain number average molecular weight. However, the number average molecular weight has certain relationship with weight average molecular weight, so the person skilled in the art can easily determine the number average molecular weight similar to that in claim 1 from the weight average molecular weight disclosed by Takagi.

As to difference (3), the person skilled in the art can confirm that claims 1,4, 11 and 12 aims to resolve the technical problem of improving the photosensitivity of the photosensitive resin.

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Suwa discloses a quinone diazide compound as a component in the positive photosensitive resin composition having the structure, which is substantially identical to the instantly claimed (Example 5). Accordingly, difference (3) has been disclosed by Suwa and acts the same function of improving the photosensitivity of the photosensitive resin in Suwa's reference as in claims 1, 4, 11 and 12. That is to say, Suwa has given the teaching of applying the quinone diazide compound having the above structure into the positive photosensitive resin composition. Under this teaching, the person skilled in the art has motivation to replace the quinone diazide compound of Takagi with this quinone diazide compound so as to obtain the technical solution of claims 1,4, and 11-12. Therefore, claims 1, 4, 11 and 12 neither have prominent substantive feature nor represents notable progress, thus having no inventiveness over the combination of Takagi's and Suwa's references.

With regard to the limitations of claim 2, the combined teaching of Takagi, Watanabe and Suwa does not disclose the residual monomer ratio of the alkali-soluble resin. It is noted that the residual monomer ratio in the alkali-soluble resin belongs to a purity issue. The person skilled in the art can reduce this value by suitably adjusting the reaction conditions and/or adding the subsequent process, and can anticipate the improvement on the performance of the display device under the lower residual monomer ratio of the alkali-soluble resin through logical analysis.

With regard to the limitations of claims 3 and 10 Takagi discloses that the amount of the 1,2-quinone diazide compound is preferably 10-50 parts by mass relative to 100 parts by mass of the alkali-soluble resin, which is within the claimed range.

With regard to the limitations of claims 5, 13 and 14, the combines teaching of Takagi and Watanabe does not disclose that the claimed formula of 1,2-quinone diazide compound.

Suwa discloses that the 1,2-quinone diazide compound has the following structure (Example 4), which is substantially identical to the claimed structure.

That is to say, Suwa has given the teaching of applying the quinone diazide compound having the above structure into the positive photosensitive resin composition. Under this teaching, the person skilled in the art has motivation to replace the quinone diazide compound of Suwa with this quinone diazide compound so as to obtain the technical solution of claims 5, 13 and 14.

It is worth to mention that an obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound, in the expectation that compounds similar in structure will have similar properties." *In re Payne*, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 979). See *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963) (discussed in more detail below) and *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1991) (discussed below and in MPEP § 2144) for an extensive review of the case law pertaining to obviousness based on close structural similarity of chemical compounds. See also MPEP § 2144.08, paragraph II.A.4.(c).

With regard to the limitations of claim 6, Takagi discloses that the alkali-soluble resin also comprises no epoxy group (abstract).

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With regard to the limitations of claims 7, and 15-18, Takagi discloses that the epoxy-based curing agent may contain one or more epoxy group (pages 13-14, [0054]), specifically for the crosslinking compounds having $m=2$ and $n=2$. On this basis, the person skilled in the art can easily conceive to adopt a crosslinking compound containing at least 3 epoxy groups.

With regard to the limitations of claims 8, 19, and 20, Takagi discloses that surfactant can be added for improving spreading properties of the photosensitive resin composition (page 22). Although the using amount of the surfactant relative to the alkali-soluble resin is not disclosed by Takagi, it is noted that "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%.); therefore the amount of surfactant can be determined by the person skilled in the art through routine experiments.

With regard to the limitations of claim 9, Takagi discloses that the components of the positive photosensitive resin composition is dissolved in solvent with a solid content concentration of 5-60 wt % when using said composition (page 21, [0093]).

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL M. BERNSHTEYN whose telephone number is (571)272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael M. Bernshteyn/
Examiner, Art Unit 1796

/M. M. B./
Examiner, Art Unit 1796

/David Wu/
Supervisory Patent Examiner, Art Unit 1796